THIRD WORKSHOP ON THE USE AND ABUSE OF BLOOD AND BLOOD PRODUCTS IN CLINICAL SETTINGS

Report on a WHO Workshop

Annecy, France
28–30 January 1999
ABSTRACT

The Workshop on the use and abuse of blood and blood products in clinical settings is related to the concept of continuous quality of care development (QCD), which focuses on outcomes of care, cost-effectiveness and optimal use of resources. The effective use of blood is an integral component of health care reforms, as the inappropriate use of blood and blood products represents a major risk for the population, in addition to augmenting the cost of health care services. The First Workshop, held in June 1996, was part of the project for emergency aid for improvement of the blood supply in Albania. The Second Workshop, held in February 1998, expanded the programme, and included an in-depth look at the adequate use of blood and blood products in obstetrics and perinatology, as well as clinical assessment and quality management. This Third Workshop focused on development and implementation of the recommendations from the Second Workshop, concentrating on results of data collection for monitoring, evaluation and feedback in the areas of cardiac surgery and obstetrics, and the use of blood products. An overview was made of the achievement in specific projects involving Albania and Romania.

Keywords

BLOOD TRANSFUSION – utilization
BIOLOGICAL PRODUCTS
QUALITY ASSURANCE, HEALTH CARE
CARDIAC SURGICAL PROCEDURES
OBSTETRICS
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1. PREFACE AND EXECUTIVE SUMMARY

This Third Workshop on the Use and Abuse of Blood and Blood Products in Clinical Settings was held in Annecy, France, from 28 to 30 January 1999. It is part of an initiative by the WHO Regional Office for Europe (WHO/EURO) to promote the WHO principles of good clinical transfusion practice, and to debate strategies for alternative measures to reduce, whenever possible, the use of blood and blood products.

This report documents the proceedings of this meeting. It included contributions dealing with blood usage in obstetric practices. The first by Dr Stephen Sturgiss describes a strategy for changing regional practice based on a number of guiding principles and a regional audit. The second contribution described the WHO Obstetrical Quality Indicators and Data Collection (OBSQID) database and its possible role for measuring outcomes between institutions to identify best practice. The third contribution came from the Netherlands and described an attempt to redefine anaemia in pregnancy and document the rate of transfusion during pregnancy.

Three other presentations in the field of clinical transfusion practice: the first describes blood usage in two cardiac surgery units in Norway. It describes protocols for reduction of use of homologous blood and a programme of autologous blood salvage. The second, from Rotterdam, describes the use of albumin and plasma substitutes in blood volume replacement. The third was from the United Kingdom, and described the United Kingdom National Programme for reporting Serious Hazards of Transfusion (SHOT). The main message from this last presentation is that almost 50% of the serious hazards reported were due to identification errors in the blood specimen, records and recipient details. The report also highlighted other dangers, such as transfusion-related graft-versus-host (GVH) and acute lung injury (TRALI).

The meeting also included four country presentations from Albania, the former Yugoslav Republic of Macedonia, Romania and Slovenia, as well as a report from the European School of Transfusion Medicine (ESTM) and another on the growing epidemic of sexually transmitted diseases (STDs) and the effects on blood safety in the newly-established countries of eastern Europe and central Asia.

A summary of the Workshop Proceedings also features in this report, with specific recommendations from the eight working groups, some of these are very valuable, while others may require further evaluation.

The report, in general, was skilfully compiled by the Rapporteur and reviewed by three independent transfusion medicine experts. Their remarks are attached in Annex 1. Most of their comments were taken in the preparation of this document and will be included in the preparation of next year’s workshop. The most recent WHO document on Clinical Use of Blood*, which will be the central theme of next year’s meeting and workshop, due to take place in Annecy in November 2000, is available on request.

Dr G.S. Gabra

Head of WHO collaborating centre for training and development in transfusion medicine
Birmingham Centre, National Blood Service, United Kingdom

* WHO/BLS/98.2
2. OPENING OF THE MEETING

The meeting was opened on 28 January by Dr Staehr Johansen, Quality of Care and Technologies (QCT), WHO Regional Office for Europe. The welcoming address was given by Dr Gilles Landrivon, Director, Mérieux Institute.

In his welcoming address, Dr Gilles Landrivon, Director, Mérieux Institute, said that he was delighted that WHO had chosen to hold its series of workshops on blood and blood products in Annecy and in particular at the Mérieux Institute. From the outgoing Director, Mme Macha Musset, now affiliated with the Association Bioassistance, he was aware that last year’s workshop on Adequate Iron Stores and the “Nil Nocere” Principle in Transfusion Medicine had been a great success. As an obstetrician, he was particularly interested in this year’s topic, the Use and Abuse of Blood and Blood Products in the Clinical Setting, which was an important issue for obstetricians as it was for all clinicians. Dr Charles Merieux had expressed interest in the Workshop and had agreed to attend the following day.

3. INTRODUCTION TO THE WORKSHOP

Dr Staehr Johansen, in thanking Dr Gilles Landrivon for his welcome, said the Institute provided the ideal inspirational setting for the work of the group and would welcome the presence of the esteemed Dr Merieux. The Third Workshop would focus on the reduction of unnecessary use of blood and blood products and on the use of data collection and databases for achieving this purpose. The rational use of blood was an important medical issue which needed addressing as a matter of urgency. The use of blood transfusion in obstetric practice was a case in point. In some areas women were being transfused several units of blood despite having normal uncomplicated deliveries. Pregnant women were also being misdiagnosed as anaemic and being prescribed iron replacement therapy. This problem had been discussed at the last workshop. Similar bad practice was also occurring in other areas, in particular cardiac surgery, which would be discussed at the workshop. Other topics, including serious hazards arising from transfusion, the reduction of transfusion transmitted infections and the use of plasma substitutes would also be discussed.

Dr Staehr Johansen expressed gratitude to those participants who had travelled great distances to attend the Workshop, and welcomed colleagues from WHO headquarters as well as representatives form the European Commission and the Council of Europe.

Professor Bjarte Solheim was elected Chairperson and Dr Heidi Doughty was elected Rapporteur of the Workshop.

4. CLINICAL USE OF BLOOD

4.1 Blood transfusion in obstetric practice (Dr Stephen Sturgiss)

The main problem with regards to blood use in European obstetric practice appears to be unnecessary transfusion. Attempts to restrict the administration of blood and blood products to those women genuinely requiring transfusion therapy should be guided by the following principles:
**First do no harm** – in countries where safe blood/blood products are freely available, such as the United Kingdom, women still die as a result of inadequate resuscitation (Confidential Enquiry into Maternal Deaths in the United Kingdom, 1991–1993). It would be a tragedy if attempts to reduce inappropriate transfusion, no matter how well intentioned, resulted in increased maternal mortality from inadequate resuscitation. Attempts to reduce transfusion should be accompanied by an audit of complications arising from inadequate resuscitation, including death.

**Quantify the problem** – transfusion rates vary widely from hospital to hospital without apparent differences in outcomes (Andres, et al, Klapholz, et al). The first step in reducing unnecessary transfusion is widespread measurement of transfusion rates. Obstetric units with high transfusion rates might be prompted to analyse their transfusion practices, whereas units with low rates might provide examples of good practice.

**Performance indicators** – comparisons between hospitals should include the use of performance indicators, such as pre- and post-transfusion haematological indices.

**Care provider education** – a critical component of producing reduction in unnecessary transfusion is the education of medical staff and nurses/midwives with regards to the appropriate use of blood. Morrison, et al (1993) clearly showed that an intensive education programme for junior medical staff has the potential to reduce obstetric erythrocyte transfusion rates by about 60%.

**Guidelines for transfusion** – an education programme should include the formulation of guidelines for transfusion. Guidelines are available for general use (NIH, 1988; American College of Physicians, 1992). These guidelines stress the use of clinical rather than haematological triggers for transfusion.

**Changing regional practice** – the extent to which erythrocyte transfusion rates in the north of England can safely be reduced will be tested over the next year by the following study.

- Obstetric transfusion rates will be quantified at a central teaching hospital (Royal Victoria Infirmary, Newcastle upon Tyne).
- Appropriateness of transfusion will be analysed with performance indicators (clinical and haematological).
- An education programme for junior medical/midwifery staff will be formulated, paying particular attention to areas of sub-optimal practice as identified by the audit.
- Following the education programme, transfusion rates/performance indicators will be reviewed.
- Simultaneously, region-wide transfusion rates will be audited.
- All units will be informed of their transfusion rates.
- An educational programme will be offered to units with high transfusion rates.
- The regional audit will be repeated.
4.2 Blood transfusion and non-blood management in obstetrics (Dr Dina Pfeifer)

Differences in transfusion rates between obstetrical units are immense. Women with moderate haemorrhage or post-delivery anaemia are overtransfused. Evidence suggests that blood consumption in women with moderate haemorrhage and post-delivery anaemia can be reduced without harming the mother or neonate.

The Obstetrical Quality Indicators and Data collection (OBSQID) database of the WHO Regional Office for Europe, includes aggregated data on more than 13 million births from 43 countries. The latest aggregated national data on blood transfusions during or after delivery range from 0.006% and 6.92% of women giving birth (http://qct.who.dk, accessed 28 February 2000). The transfusion rates in obstetrics varies reflecting the incidence of high risk pregnancies, severe anaemia, abnormal labours and deliveries, different characteristics of resident populations and not least the presence or absence of transfusion practice audits. The institutional blood transfusion rates range from as low as 0.0% to 9.4% of deliveries.

The OBSQID project. The pilot case based study, the OBSQID project, with 33 participating centres form 23 countries of European Region (western European, central European and newly independent states) was conducted in 1997. The pilot indicated that on average, 2.34% giving birth receive blood in central European countries and 4.27% in western European countries. The odds of an antepartum haemorrhage and blood transfusion was 8.3 and 2.5 for central and western Europe respectively. The odds of intra- or post-partum haemorrhage (>500ml) and blood transfusion was 45.2 and 5.8 in central and western Europe. Women having premature delivery were 2-3 times more likely, and those undergoing breech delivery 3 times more likely to require a blood transfusion.

Does the risk of obstetric haemorrhage or acute anaemia outweigh the blood transfusion associated risk? Although blood in many western countries is safer now than it has ever been, there are infective and non-infective risks.

Guidelines for transfusion. There is no current international consensus regarding the triggers for transfusion in obstetrics. Guidelines will need to recognize the unique physiological circumstances of the pregnant women. No single measure can replace good clinical judgement as the basis for decisions regarding transfusion. Consensus using laboratory and clinical parameters is needed to guide practice and reduce unnecessary transfusion. Transfusion committees should frame guidelines to reflect local resources.

Evidence-based medicine can improve patient care by placing practice on a more secure scientific foundation. For obstetrical practice, this means continuous collation and analysis of pregnancy outcome data. The outcomes between institutions and countries should be compared to identify which methodologies lead to good outcomes. The WHO Quality of Care and Technologies Programme offers a forum for comparing obstetric quality data at its internet site for either aggregated or care based data.

The following issues are known to be associated with avoidable transfusion and should be addressed in clinical guidelines.

- Anaemia in pregnancy
- Obstetric haemorrhage
- Caesarean section
- Semi-experienced staff.
4.3 Anaemia in pregnancy (Dr Anders Ole Agger)

The standard definition of anaemia is not appropriate in pregnancy. Transfusion may be considered at considerably lower levels of Hb. The use of transfusion was described in a study of 10 115 deliveries.

Introduction. Anaemia is a reduction in the total circulating red blood cell mass. During pregnancy, there is a physiological expansion of the maternal blood volume. The plasma volume increase (40–60%) is approximately double the concomitant increase in circulating red cell mass. This “anaemia” of pregnancy during the second and third trimesters reduces the lower normal limits for haemoglobin. It is also well known that the dilutional effects of the plasma volume expansion masks the actual absolute increase in maternal red cell mass that accompanies normal pregnancy.

Is the actual WHO definition of anaemia which is: Haemoglobin of 11.0 g/dl = 6.9 mmol/l appropriate? A new definition should be made, based on red cell parameters, due to the wide individual variations in plasma volume expansion, and the expansion of the red cell mass.

Study. Among our women in this study, anaemia is defined as a level of haemoglobin ≤ 6.5 mmol/l without any reference to the red cell parameters, i.e. MCV, MCHC. The study group consisted of both normal pregnancies (52.6%) and pregnancies with complications. Parity P1 = 40.9%, P2 = 36%, P>4 = 1.5%. 9868 pregnancies were singletons, 241 were multiple. The caesarean section rate was 13.7%. 546 women had a haemorrhage >500ml.

The occurrence of anaemia (Hb≤ 6.5 mmol/l) among our women is:
Anaemia post-partum (1137*100)/10115 = 11.2%

Some 960 women did not receive a blood transfusion due to either refusal by the woman or the clinical decision that no transfusion was indicated.

Some 187 women were transfused. (187*100)/10115 = 1.9%

The need for transfusion amongst all anaemic women was calculated as: (187*100)/1137 = 14.6%.) The need for transfusion in uncomplicated pregnancies was 1.2%.

Conclusion. The study demonstrated that using a revised definition of anaemia, only 14.6% women required transfusion in a population with normal and complicated pregnancies. The transfusion rate in normal pregnancy was 1.2%

4.4 Blood transfusion in cardiac surgery (Professor Bjarte Solheim and Dr Eivind Övrum)

Cardiac surgery is traditionally a large user of blood and blood components. Results from two centres are presented. The first is a university centre managing referrals for open heart surgery with additional risk factors. The second is a cardiac centre handling mainly elective coronary bypass surgery with a successful blood salvage programme (1).

Restriction of homologous blood transfusion has become mandatory in modern cardiac surgery to decrease the risk of infection and allo-immunization and because of the scarcity and costs of
donor blood and blood products. In addition, patients receiving homologous blood have been shown to be at higher risk of postoperative wound infection. Despite the development of a wide variety of blood conservation techniques, the homologous blood requirement still remains considerable, even in primary elective myocardial revascularization. A recent report has indicated a blood transfusion rate of 75% in patients who undergo primary myocardial revascularization (2).

A 922 consecutive separate cardiothoracic operations with extracorporeal circulation performed on 898 adult patients were followed up. The time frame was May 1994 to December 1995. Most of the patients at the Rikshospitalet represented a selected group with complicating factors such as emergency or repeat cardiac surgery or factors such as diabetes, uraemia and poor ventricular function.

Some 66% (610/922) were transfused with a median of 7 units. 49% received SAGM red cells, 49% received fresh frozen plasma (Octoplas) and 18% platelets. The number of units given for a procedure showed that 29% received 1–2 units and 34% received >11 units.

B 2326 patients undergoing myocardial revascularization using a non-pharmacological blood salvage programme were analysed. The material was divided into two groups: patients undergoing a primary coronary bypass operation (Group P, n=2298) and a smaller subset of patients undergoing repeat coronary bypass operation (Group R, n=28). At least one internal mammary artery was grafted in 99% of the patients, with supplemental saphenous vein grafts. Intraoperatively, autologous heparinised blood was removed before bypass and retransfused at the conclusion of extracorporeal circulation. The volume remaining in the extracorporeal circuit was returned without cell processing or haemofiltration. Autotransfusion of the shed mediastinal blood was continued hourly up to 18 hours after surgery in all patients. The mean postoperative mediastinal drainage in Group R was 543±218 ml, compared to 703±340 ml in Group P (P=0.01). In Group R, 1 patient (3.6%) received packed red cells and no patients were given other homologous blood products, compared to 33 patients (1.4%) given red cells and 35 patients (1.5%) given plasma transfusion in Group P (NS). Thus, in total, 2257 patients (97.0%) were not exposed to any homologous blood products during hospitalization. Total haemoglobin loss was significantly higher in Group R, resulting in a mean haemoglobin concentration at discharge of 109±14 g/l in Group P (P=0.0002). Post-operative complications were few and the total in-hospital death rate was 0.5%.

Discussion. Removal of autologous blood before bypass provides the immediate post-operative availability of fresh blood with nontraumatised platelets. This technique has significantly reduced postoperative bleeding according to several reports. In our patients, more than 800 ml of autologous blood was withdrawn in approximately 85% of the patients, and the volume was replaced by Ringer’s acetate from the pump, thus avoiding hypotension and potential myocardial ischaemia. The lowest haematocrit recorded during cardiopulmonary bypass was mean 23.0±2.5%. Following the reversal of heparin and optimal surgical haemostasis, the autologous blood was returned to the patient.

Transfusion of the remaining blood in the oxygenator at the conclusion of bypass has proved to be a safe and reliable technique of saving blood. Additional refinement of this method using different red cell spinning devices or haemofiltration to increase the haematocrit of the residual volume in the oxygenator, has proved effective. However, the costs are not negligible and the processing of the blood is time-consuming. In the present series, the diluted blood remaining in the extracorporeal circuit was re-transfused to all patients, either in the operating room or in the
intensive care unit. Despite the absence of haemoconcentration or ultrafiltration, there were no clinical signs of volume overloading, and the patients could be extubated with adequate blood gases at a mean of 1½ h after arrival on the intensive care unit.

Autotransfusion of shed mediastinal blood has become widely popular since the first report by Schaff, et al (3). The clinical safety of this technique has been proved by the lack of septic, pulmonary or hepatic complications, as well as the absence of disseminated intravascular coagulation. Like others, we routinely use a hard-shell cardiotomy reservoir for retransfusion in a closed circuit system, and we were able to save as much as 97% of the shed blood. All patients in the present series were autotransfused, and no transfusion related side effects like increased bleeding or renal impairment could be demonstrated. As much as 4000 ml. mediastinal shed blood was reinfused in an extreme situation of sudden massive bleeding, without recognisable adverse effects or the need for donor blood.

The use of pharmacological control of bleeding such as tranexamic acid and aprotinin is used by other centres but was not used in the salvage programme described here.

In conclusion, a simple conventional blood salvage protocol seems to be at least as effective as pharmacologic agents or complicated devices to reduce blood loss after primary and re-do coronary bypass grafting.


5. BLOOD TRANSFUSION HAZARDS AND BLOOD SUBSTITUTES

5.1 The United Kingdom experience of Hemovigilance (Dr Heidi Doughty)

An overview of the first year of hemovigilance in the United Kingdom. The following is a summary of the SHOT report(1).

*Introduction.* Blood transfusion is a widely used therapy in hospital practice. Nevertheless, there has been a growing awareness among Transfusion Specialists in the United Kingdom and other countries that there is little information on the current safety of the whole transfusion process from donor to the patient. The serious hazards of transfusion (SHOT) initiative presents the first moves in the United Kingdom towards systematic hemovigilance. Hemovigilance is a broad term which may be used for any process to monitor morbidity or mortality arising from blood transfusion. The SHOT scheme was launched in November, 1996. SHOT is a voluntary, confidential, anonymous system which aims to collect data on serious adverse advents of transfusion of blood or blood components. SHOT aims to use the data to inform recommendations to improve transfusion safety.

Through the participating Royal Colleges and Professional Bodies, SHOT findings can be used to:

- disseminate policy within transfusion services
- improve standards of hospital transfusion practice
aid production of Clinical Guidelines for use of blood components
educate users on transfusion hazards and their prevention.

The clinical transfusion process. The complexity of the transfusion process has been illustrated by the work of McClelland, et al (2). The process starts with identifying the need for blood resulting in patient testing and ends with the bedside check before administration of the blood. A large number of people of varying professional training and knowledge are involved in the delivery of a safe unit of blood to a patient. In the United Kingdom, these fall into three broad groups.

1. The United Kingdom Transfusion Services, responsible for selection of donors and processing and testing of the unit.
2. The Hospital Blood Bank, responsible for component storage, selection and compatibility testing.
3. Portering/Nursing Staff, responsible for withdrawing the crossmatched sample, delivering blood from the laboratory to the ward, for administrating the transfusion and monitoring the patient.

In the United Kingdom, regulation and training of these three bodies is controlled by different agencies. The Transfusion Centres are required to hold a manufacturers’ special licence from the Medicines Controlled Agency. Hospital Blood Banks can now gain accreditation through the Clinical Pathology Accreditation Scheme and are encouraged to participate in external quality schemes. Clinical practice is guided by guideline documents produced by The British Society for Haematology Transfusion Task Force and The British Committee for Standards in Haematology. In contrast to the pharmaceuticals industry, there is no post-marketing surveillance, i.e. central reporting of incidents relating to the clinical process.

Management of the scheme. The strategic direction of SHOT comes from a steering group with wide representation from royal colleges and professional bodies representing medical, nursing and laboratory staff. The operational aspects of the scheme are the responsibility of a Standard Working Group which is accountable to the Steering Group. Two National Co-ordinators are responsible for receiving and collating reports. SHOT was affiliated to the Royal College of Pathologists in November, 1997. Participation in the scheme is voluntary. Both public and private hospitals in the United Kingdom and the Republic of Ireland, as well as public hospitals in the Guernsey, Jersey and the Isle of Man are invited to report. SHOT invites reports of major adverse events surrounding the transfusion of single or small pool blood components supplied by transfusion centres. It does not cover complications of fractionated plasma products.

The local clinician responsible for transfusions notifies the central office using an initial report form. The National Co-ordinator then allocates a number to the case to maintain confidentially and issues the local clinician a detailed follow-up questionnaire specifically designed for the hazard reported. Once complete, the information from the questionnaire is anonymously entered onto the SHOT database. Suspected cases of transfusion transmitted infection are reported to the supplying blood centre. Blood centre involvement is essential to ensure withdrawal of other components and appropriate donor follow-up. The blood centres then report these cases to a Central Communicable Disease Surveillance Centre.

Data is stored in a password protected database in a secured location. Once information has been entered, all paper copies are shredded. SHOT does not provide details of individual cases or any other form of summarized data to outside person or Organization other than in the form of an annual report.
Overview of results from 1996 to 1997. 94 hospitals out of the 124 hospitals (22%) receiving information about the scheme submitted data. The 94 hospitals submitted 169 initial report forms. Approximately half of these incidents were due to the wrong blood or component being transfused to the wrong person. 141 follow-up questionnaires had been analysed in preparation for this report and an overview of the data showed there had been 12 deaths, 39 cases with major morbidity and 90 cases in which there were minor or no morbidity. Major morbidity was defined as:

- intensive care admission and/or ventilation
- dialysis and/or renal dysfunction
- major haemorrhage
- jaundice, including intravascular haemolysis
- persistent viral infection
- acute systemic confirmed infection.

Further analysis of the 81 cases of incorrect blood/component transfused investigated the site/sites of the error. The analysis demonstrated that although administration of blood was the first documented site of error, there was often an antecedent error, i.e., multiple errors contribute to many “wrong blood” incidents. Clerical errors contributed to mistakes during collection and during the laboratory handling of samples. Errors in withdrawal of blood components from storage locations and bedside procedure were significant contributions to incidents.

Discussion. The approach to hemovigilance varies between countries. Some of the key questions to be asked before establishing a hemovigilance system include:

- should reporting be voluntary or mandated by law and what are the medical legal implications;
- what range of complications should be included, although major incidents should be covered will the inclusion of minor reactions, overwhelm the reporting system;
- should the system monitor “near miss events” where an error is discovered in time;
- should patients be tested following transfusion for evidence of infection;
- who should own the reporting system; the Government, Blood Institutes or Clinicians and who should provide resources.

The United Kingdom system achieved a limited success in the first year because participation was low. From April 1999, all institutes will be encouraged to take part in the reporting system in addition to setting up local hospital transfusion committees.

Recommendations. In the 1996–1997 report the following recommendations were made:

1. Pre-labelled sampling tubes should not be used.
2. Request systems for blood and components should ensure prescription issue and administration of the correct component.
3. The system should cover special requirements and telephone requests.
4. The system should clarify the respective responsibility of the different staff involved.
5. Access to previous transfusion records in the laboratory containing grouping information should be available at all times and used as appropriate.
6. Blood banks should review procedures and systems, including enforcement of the clinical guidelines and standards available, in addition to training to prevent errors of sample handling.

7. Hospitals should review their current system to ensure that errors in transfusion can be prevented.

8. Standards should be set for a minimal formal identification requirement when a component is collected.

9. Hospital systems should ensure that inpatients and outpatients can be identified at the time of both sampling and transfusion, especially in the outpatient departments where patient identity is often not available.

10. The bedside check is vital in preventing transfusion error.

11. Staff should be vigilant in checking identification details of the component against those of the patient.

12. Every hospital should have a policy for formally checking the blood component at the bedside.

13. Blood components should always be administered against a written prescription.


5.2 Reduction of transfusion-transmitted infections (TTI) (Dr Alexander Gromyko)

This presentation outlined one of the strategies designed to address the rising prevalence of HIV in eastern Europe and central Asia.

Introduction The social and economical upheaval throughout eastern Europe has had very damaging social consequences with real danger to the blood transfusion services in these countries. Thirty-four countries have provided results of HIV screening in blood donations for 1996. HIV prevalence in blood donations was over 4 per 100 000 in 8 countries. The countries with the highest prevalence in 1996 are clustered in the south and centre of the Region. HIV prevalence was particularly high in Ukraine (43 per 100 000 in 1996). The prevalence has increased in the Republic of Moldova and the Russian Federation. The increase coincides with the spread of the infection among injecting drug users and the spread of sexually transmitted diseases (STDs). The high incidence amongst blood donors emphasizes the need for sound donor selection procedures.

WHO has been particularly active in the field of blood safety in these regions during the last two years. Activities have included providing distance learning material in Russian in addition to running seminars and workshops. In October 1998, plans were discussed for the development of a strategy on safe blood transfusion in view of the growing epidemic of STDs, by a task force for the urgent response to the epidemics of STDs in eastern Europe and central Asia. The aims were:

- In consultation with affected countries, elaborate a harmonized strategy for international assistance that will reduce the burden of STDs and their health consequences in the Region.
- Mobilize and advocate for national and international resources for STD prevention and care in affected countries.
- Ensure that external technical and financial support to affected countries is both timely and well coordinated in order to avoid duplication, address gaps and to maximize the impact of the contributors.
- Enhance local capacity of countries in the region to respond to the STD epidemics.
- Serve as a channel for the international exchange of epidemiological and programmatic information on the STD situation and needs of the Region.
- Develop and promote international “best practices” and policies while ensuring that conditions and issues particular to this region are taken into consideration.
- Advise UNAIDS, its cosponsors and other partners on policy and strategies related to STD prevention and care in the Region.

5.3 Use of plasma substitutes in the Academic Hospital, Rotterdam (Mr Paul J. J. M. Janssen)

In the Academic Hospital, Rotterdam, there is a yearly turnover of 37,000 units of colloidal plasma substitutes. Almost 14,000 units of albumin are used every year. The use of albumin has not significantly changed after the publication of the paper by the Cochrane Injuries Group in which the administration of albumin in critically ill patients was reviewed. As a result of this publication the importance of albumin as a plasma substitute has been discussed and new protocols are developed for the use of colloids. Gelatines are most often used when a plasma substitute is needed. Starches have an intermediate position and dextrans are used in specific surgery such as plastic and vessel surgery. The plasma substitutes are responsible for almost 4% of the drug costs in the hospital.

Albumin has a molecular weight of 69 kD and a terminal half-life of 17.5 hours. In the Netherlands, albumin is available as a 20% hypertonic and a 4% isotonic solution. Dextrans are polymers of glucose molecules with an average molecular weight between 40 to 70 kD. Dextrans are degraded by endogenous dextranase and excreted. They have a marked effect on the coagulation of the blood. Gelatin is a degradation product of animal collagen. The influence on coagulation is less profound compared to the dextrans. Because of its origin, gelatins are being discussed regarding the transmission of prions resulting in bovine spongiform encephalopathy. Hydroxyethylstarches consists of synthetic polymers of amylopectin with an average molecular weight of 200 kD. The starches are degraded by endogenous amylase and the terminal half-life is dependant on the degree of substitution of the hydroxyethylgroups.

The gelatins have a half-life, dependent on the average molecular size, between three and nine hours. Twenty-four hours after administration, 10% of the administered amount is found in the vessels, 20% is located extravascularly, the rest is excreted. Twenty-hour hours after administration of the hydroxyethylstarch with the longest half-life there is 49% in the circulation, 15% is located extravascularly and 36% is excreted. The dextrans and starches with a shorter half-life have an intermediate position, between the gelatins and the long life starches.

When a albumin solution of 20% is infused the effect on circulating volume is 300%. The 4% solution and the gelatins are iso-oncotic. The volume effect of hydroxyethylstarches is 100 and 145% of the 6 and 10% solution, respectively. The effect on circulating volume caused by
Dextran is rather short. The plasma substitutes with the least reported adverse reactions are starches. One in 150,000 administrations results in a more or less serious adverse event.

In order to develop a protocol for the use of plasma substitutes four criteria are taken into account; efficacy, effectiveness, therapeutic value (in which adverse effects, contra-indications and users convenience play an important role) and efficiency. The choice between colloidal solutions as universal plasma substitutes has to be based on the latter two criteria.


5.4 The contribution of the European School of Transfusion medicine (ESTM) to the rational, effective use of blood and blood products and to the “quality” of clinical indications for transfusion therapy (Professor Umberto Rossi)

**Background** The birth (in April 1992) and the rapid growth of the European School of Transfusion Medicine (ESTM) are a clear witness of the profound need for the harmonization of Transfusion Medicine teaching within Europe, Europe being understood as a geographical Europe extending beyond the political boundaries of the EC and CE. The ESTM is open to all levels of professionals contributing to the process and progress of Transfusion Medicine.

The aims of the ESTM were defined as “to provide a specialist teaching of Transfusion Medicine, of an international and European character, for physicians and other graduates and para-medical personnel involved in transfusion practice”. The ESTM seeks to achieve its aims by organizing meetings, courses, seminars, symposia and fellowships on all subjects concerning Transfusion Medicine and by publishing proceedings of its activities in collaboration with national and international organizations.

**Support for eastern Europe.** ESTM courses have been taking place increasingly in eastern European countries. An ESTM Fellowship Programme has been established to collect funds in order to enable eastern European colleagues to participate in ESTM courses. A translation of the AABB Technical Manual into Russian was started in 1997, and will soon be ready, to be sponsored by institutions and firms and distributed free to doctors and technicians working in blood transfusion in Russian-speaking countries. A “twinning programme” between Romanian and Italian Blood Transfusion Centres was started in 1998, in agreement with WHO and the Romanian Government, and is currently developing, thanks to the help of many Italian colleagues.

**Support from other organizations.** All the above activities are supported by the Italian National Society of Transfusion Medicine and Immunohaematology (SIMTI), as well as other European National Societies and the WHO Regional Office for Europe. The Royal College of Pathologists (London), in 1995, has recognized ESTM courses as being appropriate for Continuing Medical Education (CME) purposes, enabling course attendants to receive CME credits as the rate of one credit per hour.

The ESTM has, and continues to contribute to a “European Quality” of Transfusion Medicine through education by promoting the rational, effective use of blood and blood products in the clinical setting.
6. DATA AS A TOOL FOR QUALITY OF CARE DEVELOPMENT

6.1 How to launch an Internet service for collection and transfer of data within different health centres (Mr Simion Pruna)

The development of WHO/EURO care quality programmes has required considerable investment by the Centre of Telemedicine Romania (CTR) to establish a global internet connection. This paper focuses on the next big challenge facing CTR: how to extend access of CTR to a wider range of health centres, in connection with the WHO/EURO programmes in Romania and the Black Sea region. This goal can be achieved by launching an Internet service that would be considered a model for quality care programs. The Internet services would include at a minimum; e-mail, news and direct Internet connection. Critical issues raised by this challenge include:

Connecting the centres (analogue and digital dial-up, dedicated access). On a technical level, providing transit of Internet traffic is a more complex and difficult task than providing Internet access for a single organization. The main objective would be to connect all our partners in the 42 counties in Romania to a main CTR server and to enable them to exchange data. Another feature that can be added is e-mail accounts on the main server. Also access to the Internet can be provided if the costs for the traffic on the server are covered.

Packaging the services offered. For dial-up users, the basic package typically consists of software, a dial-up account, and one or more e-mail addresses. Supplying dial-up access software not only helps the user by providing them with what they need to get started, but also helps the CTR. If the software is pre-configured as far as possible, then the CTR can eliminate many of the typical calls to the help-desk with configuration questions and complaints. We find that the majority of help-desk calls relate to software configuration issues, so it makes sense to offer pre-configured software with good instructions to each participating centre into the CTR’s network for the clinical trials. Considering the current configuration at our CTR’s headquarters, we can emphasize the following alternatives:

1. Direct dial-up access to the main server from all the locations of the partners. If the partners do not have access to an Internet connection, the main server at the CTR headquarters can be equipped to support multiple connections as dial-up server on regular phone lines. The system will have the following characteristics.
   • The hardware consists of a multiple port communication card and one modem connected to a telephone line for each port. Standard industry solutions are available for 8 and 16 ports which should be enough for up to 50 dial-up accounts.
   • Additional costs are imposed by installing multiple hunting phone lines to make the dial-up possible.
   • The costs for the clients will be the modem hardware and the phone bill for the time spent on line. If the dial-up accounts will be used only for data transfer and access to the mail, the solution is reasonable, even for connection with high charges from countryside.

2. Remote access using existing Internet connection. If the partners have access to the Internet by a leased line or on a dial-up connection located in the residence city, the server can be configured to be available for file transfer and for remote e-mail retrieval. The file transfer can be done using the FTP protocol implemented directly or through a friendly web interface on the web...
server of the Centre. The e-mail address can be implemented by setting up POP3 access for Internet clients.

- This alternative does not require additional costs for the centre other than the design for the web page and the maintenance on the server system. For that matter, we would recommend implementing this option on the Centre server, regardless of the decision to use any of the other options.

- The costs for the partners would imply setting up a regular dial-up account, but will reduce the costs in the phone bill since the dial is made to a local supplier and therefore the charges will be for a local call.

- Another advantage of this solution would be the possibility to access the internet on the same dial-up account and gain access to different resources. To encourage the surfing to internet medical-related resources, it is highly advised that the main site of the Centre would contain a start point with all the medical resources listed on categories. This way all the branches can use this page as the homepage and begin exploring from this point. This feature is subject to a more detailed study that is outside the remit of this report.

**Hardware.** Considering the industry standards and the availability for technical support that would be very important in this situation, we will present an outlined solution based on Microsoft products.

- The main server at the Centre can be based on Microsoft NT Server. The Small Business Server version is recommended because it contains the remote access server, mail server, web servers, database connectivity server and also the administration tools are integrated and well-designed with a friendly user interface.

- The branches client computers can be organizer on a Windows NT or Windows 95 (98) configuration. The protocols and tools for Internet access are available and the process to connect to the Centre can be fully automated. Also, good browsing capabilities are integrated through Internet Explorer.

**Determining resources requirements**

Technical issues cannot be handed in isolation – the platform should be built to meet the resources requirements. Offering a service requires certain marketing, sales and financial considerations. Essentially, it is a specialized form of running a business. By concentrating exclusively on the technicalities, we find that many difficulties would arise if the necessary business processes, skills and resources that are required would not be considered.

**Determining training requirements**

In order to promote information technology among medical personnel, specialized training is currently taking place on the CTR premises. A number of computer courses have been taught in order to develop understanding of the WHO different data acquisition and analysis programs.

### 6.2 Experience gained through the OBStetrical Quality Indicators and Data (OBSQID) collection (Mr Visti Juncher)

The Obstetrical Quality Indicators and Data collection (OBSQID) database of the World Health Organization, Regional Office for Europe, now includes aggregated data on more than 13 million births from 43 countries. OBSQID offers a forum for comparing obstetrical quality data through internet coordination with representatives of most participating institutions. The OBSQID project
variables and coding were standardized. Comparison of data from different countries is now possible.

Data quality and quantity must be assessed. Problems with data quality include; incomplete data, limited detection of outcomes (e.g. maternal mortality 42 days after delivery), interrupted time series, coding inaccuracies, and aggregated data (only one centre returns used to represent a whole countries practice). The maintenance of regional databases should include active verification of data. Data should be collected according to agreed protocols. The substantial challenge of maintaining or improving obstetrical outcomes will rely on the true comparability of data.

6.3 EPI Info – A tool for evidence-based medicine (Dr Dina Pfeifer)

Introduction. The benefits of clinical data bases have long been recognized. Formerly, data analysis meant calculation by hand or with a simple calculator. Statistical tables were used for accepting or rejecting hypothesis at definite levels of statistical significance. In practice this has lead to a restricted number of comparisons. Today we have data bases and statistical packages, and comparisons between many variables are done with ease. The advantages of electronic data bases include: minimal storage space, fast and accurate searches, simple to update data, easy data management, multi-user access, data presentation and reporting, and simple backup. While lack of progress has been partly due to lack of interest on the part of clinicians, managers and researchers, it has also reflected the demanding requirements for creating high quality databases.

Medical statistics and personal computers. Developments in computer technology and mass production of computer processors and other components have made computers affordable. The rapid development of newer and better equipment has made cutting edge technology affordable even for low income countries. In response to growing demand, the software market has become ultra sophisticated in addressing the vast range of user needs. Users of statistical techniques can now concentrate on understanding the underlying ideas and basic principles of statistical analyses rather than the mathematics.

EPI Info. EPI Info is a series of microcomputer programs for word processing, data management and epidemiological analysis. The development was by the Centres for Disease Control and Prevention, in collaboration with the Global Programme on AIDS, World Health Organization. EPI Info version 1 was released in 1985, and the latest available version is 6.04 updated for Year 2000 date compliance. The major advantage of EPI Info is that it is easy to learn and use aided by incorporated tutorials. The programmes allow rapid questionnaire construction, data entry and analysis. Both data entry and analysis can be programmed to provide customization and automatic operation for more permanent systems such as those for disease or injury surveillance, monthly report production, etc.

EPI Info as support for evidence-based medicine. Evidence-based medicine integrates the best available data from clinical research into clinical practice to enhance the quality of decisions and achieve the best possible outcome (1,2). The precise role of evidence-based medicine is being widely debated in view of its applicability to individual patients. Collation of data should be real time at time and place of medical services provision. Although data collection is not being pure clinical research it is considered closer to reality (3). The advantages include high generalization through the participation of a wider scale of health care providers, the ability to rapidly generate
large samples, and the opportunity to study conditions and interventions (4,5). However, practitioners have difficulty finding, assessing, interpreting, and applying current best evidence.

The importance of data comparison of institutional data is invaluable for increasing excellence through the Hawthorne effect. An example of this approach is the OBSQID database of the WHO Regional Office for Europe. Clinicians should be involved with database design to ensure that the data collected is meaningful and useful. Experience from other disciplines should also inform database design. The active participation of clinicians and researchers in designing other databases at the European level (blood utilization, diabetes, depression, low back pain, etc.) is increasingly emphasized by WHO.


6.4 How data collection can play a role: Exchange of information between centres improves rational use of blood and blood products (Dr Kirsten Staehr Johansen)

The transfusion of blood and blood products represents a potentially life-saving form of therapy, but the benefit of a transfusion must outweigh the risk it imposes to the patient. Generally, blood transfusions are given all too frequently, at times without due consideration of these risks. Primarily because of the emergence of AIDS, measures have been undertaken in the last decade to reduce the risks of transfusion-transmitted infections which have increased the safety of the blood supply infection remarkably. Despite this, however, it is recognized that total safety – the so-called “zero risk” – cannot be achieved. The 1988 WHOCARE Hospital infection surveillance and feedback program (1) examined the use of blood transfusion in general surgery over a 6-month period, registering 13 912 operations in 17 centres representing 10 European countries. Among its findings was that 15% of the transfusions recorded were given as one unit only.

The SANGUIS study (2), conducted between January 1990 and June 1992 in 43 hospitals in 10 European countries of the European Community has addressed this issue. Results of the study show surprisingly high variability among comparable surgical teams in the various participating hospitals, and it was demonstrated that 65% of patients who received blood did not fulfil the criteria for need for blood. The SANGUIS study is valuable because it documents differences not only between countries, but also among hospitals in the same country, where the organization of health care and access to products might be expected to be homogeneous. Some variables such as age, gender, pre-operative hematocrit and blood loss, have been proved to influence the proportion of patients transfused peri-operatively. However, major hospital-to-hospital differences persisted even after adjustment for these variables. In addition, other factors appear to have a powerful effect on the transfusion practice in the individual hospital. Apart from the
relevance that these results have for medical practice, this study has had important economic and organizational implications.

In cooperation with experts and professional bodies representing various medical specialities – e.g. obstetricians and neonatologists – the Quality of Care and Technologies (QCT) programme in collaboration with the European Association of Perinatal Medicine has, over the last five years, designed core data sets containing key indicators and variables including the use of blood. Software necessary for data collection, submission and analysis are made available in case the local information system is not yet able to do so (http://qct.who.dk). National aggregated data as well as case-based data are collected and can be submitted to the WHO server. It has been shown important that these data sets include fields relating to both the need and the use of blood and blood products. In this way, developments towards a rational and effective use of blood and blood products can be continuously stimulated and centres of best practice identified. It is possible, for example, to look in detail into the practices of those surgical units who rarely use transfusion, and to undertake prospective studies of their techniques and the clinical outcomes of their practice (3). The expertise of these centres can then be made available to centres which want to benefit from this knowledge. If encouraged, this approach can create a continuing discussion among clinicians and blood transfusion services, and result in better use of the unique gift provided by the blood donors to the greatest possible benefit for those patients for whom transfusion is a matter of life or death.


7. Country experiences

7.1 Romania: Use of blood and blood products in clinical settings and the relation to existing blood committees (Dr Valentina Hafner)

Use of blood. Blood safety, as a major concern of every national service, is the result of a long, complex and permanent process, starting with blood donor recruitment, to the follow-up of the recipient. Recognized standards, structured in SOPs and national guidelines have to be available at every level, to enable implementation of appropriate transfusion practices. Adequate use of blood and blood products has to start with proper information for the clinician (new therapeutic approach), and the patient (true perception of the risk). In this respect, training in blood transfusion became a part of the curricula for young anaesthesiologists and haematologists, since 1995. It is hoped that schemes for the assessment of competence in transfusion will be introduced in the future.

Updated information on therapeutic approach and attitudes, altogether with an official guide on labile products available, has decreased the use of whole blood in favour of blood components. The preparation of blood components has increased from 28% in 1997, to 36% in 1998, at a national scale; and from 50% in 1997 to 75% in 1998 in BTS Bucharest. The low number of blood donors (about 1% population) cannot ensure self-sufficiency in blood and blood products,
even with this approach. Approximately, 70% of hospital requests for blood components were covered in 1997–1998. There were no reported problems due to lack of blood suggesting that requests were exaggerated.

**Blood Committees.** The Romanian blood transfusion service is centralized and under the direct supervision of the Ministry of Health, through the National Institute of Transfusion medicine. Advice regarding policies and priorities in transfusion is given at Ministerial level via the National Commission of Blood Transfusion. Central policies are adapted at regional level by eight Transfusion Centres (large centres based in medical universities). The regional centres in turn coordinate the activity of smaller departments. The same national framework should support haemovigilance. The “embryonic” haemovigilance network (National Commission, Hospital Committee, Local Correspondent) is monitoring the use of blood and blood products and possible reactions related to the procedure. Evaluation of results may finally lead clinicians to a therapeutic consensus, for the benefit of the patient, avoiding unnecessary transfusions and reducing the exposure to risk.

**Information technology.** Centralized collection of data should enable accurate evaluation of medical performance. Computerized systems should support:

- permanent communication between users and providers (of blood and blood products) and the traceability of blood units.
- development of centralized database and evaluation through specific indicators;
- basis for quality management in the clinical use of blood and blood products.

**International support.** Romania has established a twinning programme with Italy for continuing training and postgraduate education with the assistance of WHO, CE, IFRCS. The support of other international Organizations support is also essential in building up the right attitude towards transfusion therapy in Romania.

### 7.2 The former Yugoslav Republic of Macedonia: rationalization of blood transfusion (Professor Jovan Tofoski and Professor Ivan Dejanov)

The authors propose that clinical guidelines will only have a limited effect on prescribing behaviour. The model used in Skopje is joint assessment between clinician and transfusion medicine specialist using clinical and laboratory parameters. The parameters are then entered into a computerized algorithm to guide transfusion requirements.

**Introduction** The European Commission Study “Safe and Good Use of Blood in Surgery (SANGUIS)” (Use of blood products and artificial colloids in 43 European hospitals) (Office for Official Publications of the European Communities, Brussels, 1994) demonstrated that the use of blood products is not linked to biological factors, but rather to the **attitude of the medical profession** towards blood transfusion. The following conclusions were drawn.

- The tendency to over consumption is evident in all participating hospitals and concerns all blood products.
- For the same intervention, the pre-operative stay can be 10 times longer in some hospitals than in others.
- The transfusion resources can be used as much as 30 times more in some hospitals than in others.
• These findings stress the importance for all countries to try to rationalize and optimize transfusion practice.
• Consensus papers and guidelines do not change the behaviour of the medical profession.

In order to rationalize and optimize transfusion practice in our country we have used an alternative approach to issuing guidelines. The decision to transfuse is taken with the participation of patient, doctor and transfusion medicine specialist, after considering the actual clinical condition of the patient and the past and present laboratory data.

In Skopje, the following laboratory data is used for decision-making in relation to good transfusion practice:
- full blood counts with red cell parameters and white cell differential;
- total plasma protein and albumin concentration;
- prothrombin time (PT), activated partial thromboplastin time (APPT) and thrombin time (TT).

A quantitative estimation of the necessary blood, blood products and artificial colloids is then calculated using several computer programs (Doyle, D.J. Computer Programs in Clinical and Laboratory Medicine. New York, Springer-Verlag, 1989).

Discussion. The patient is assessed after transfusion. If there is a serious risk of bleeding, a full blood count is repeated two-hourly and the need for blood transfusion re-estimated. We propose that there is a need to produce an integrated computer program that will incorporate individual smaller computer programs.

The availability of red cell parameters through the use of electronic counters assists in determining the type of anaemia on presentation. Counters also permit the rapid monitoring of blood loss and response to transfusion. The combined use of computer programs and electronic counter data produces a better quality of blood transfusion and clinical practice. Computer links between the Blood Transfusion Service and blood users will continue to improve blood transfusion and clinical practice.

We have significantly reduced the quantity of blood and blood products using the above model. The collaboration of the transfusion medicine specialist and clinician at the patient’s bedside is an essential pre-requisite for a successful transfusion and clinical practice.

7.3 Rationalization of blood transfusion in Slovenia 1998 (Dr Marjeta Potocnik)

Slovenia has a centralized blood service based on voluntary donors and has a sufficient and safe supply of blood. Health economic reforms provided the impetus for rationalization of blood use.

Since 1953, the Blood Transfusion Service of Slovenia has collected blood according to the principles of anonymous and non-remunerated blood donations with the organizational assistance of the Red Cross of Slovenia. About 100 000 blood donations per year indicates that approximately 5% of the total Slovenian population are blood donors. Collection is carried out by the Blood Transfusion Centre of Slovenia, Ljubljana (about 50 000 collected units per year) and by transfusion departments which have been established within hospitals all over the county. The entire work process is computer-controlled, so that the highest possible safety standards are
ensured. Slovenia is self-sufficient in blood and blood products. Fresh frozen plasma is sent abroad for contract fractionation. No new cases of transfusion transmitted Hepatitis B or C or HIV infection has been reported between 1997 and 1998.

The safe and sufficient blood supply had allowed the clinical community to perceive that the rational use of blood was not a priority until last year. In 1998, the need to reduce the cost of healthcare, including blood transfusions, was presented by the national health authority, by the National Health Insurance Company, as well as by hospital managers. This demand helped us to introduce measures which are intended to promote the rational use of blood and blood components:

1. The Clinical Centre, Ljubljana, which is the leading and largest hospital in Slovenia led the way. A multidisciplinary Hospital Blood Transfusion Committee met regularly during 1998, to produce guidelines for the clinical use of blood and monitoring the usage of blood and blood components in the hospital. They also worked with the Blood Transfusion Centre (BTC) of Slovenia to prepare a new standard blood request form which will be introduced in the near future. The form has been designed to promote effective clinical transfusion practice and to assist in the monitoring and evaluation of clinical blood use.

2. A special Committee for the Qualitative Use of Blood was constituted within the Surgical Clinic of the Clinical Centre, Ljubljana, to review the large blood use.

3. In May 1998, a two-day postgraduate seminar on bacterial infection in prenatology was organized by the Clinic of Obstetrics and Gynaecology in Ljubljana which included a lecture on the rational use of blood.

4. In June 1998, a session of the Blood Transfusion Association of the Slovenian Medical Society took place. The existing committee’s work was presented, together with an up-date from transfusion medicine specialists. The session concluded that hospital transfusion committees should be obligatory in all hospitals.

5. A two-day postgraduate seminar on the use of blood in surgery was organized in December 1998, by the Surgical Clinic of the Clinical Centre Ljubljana and the Blood Transfusion Centre for the promotion of the rational use of blood and blood components. Surgeons, anesthetists, transfusion medicine specialists and others from all Slovenian hospitals participated. Safety of blood transfusion, rational use of blood, as well as computerization, identification and data collection regarding the clinical side of blood transfusions were presented and discussed. The presentations of this meeting are to be published and distributed among all members of the Slovenian Medical Society, which should reach most physicians in Slovenia. A decision was made to organize another seminar on blood transfusion later this year.

**Results.** The clinical outcomes following these activities were collected for 1998 and compared with 1997.

- At the Clinic of Obstetrics and Gynaecology, the use of concentrated red cells decreased by 10%. The use of fresh frozen plasma decreased by 31%. However, the use of platelet concentrates increased by 54% due to three major bleeds in 1998.
- At the Surgical Clinic, blood use has reduced. However, there remain unexplained great differences between clinical departments.
• In the Department of Cardiac Surgery, there was a 9% decrease in the use of fresh whole blood and a 24% increase in the use of red cell transfusions. This is perhaps due to the introduction of new programmes (heart transplantation) or other expanded heart operations. There was also an increase in the use of platelet preparations of 32% and a decrease of fresh frozen plasma of 31%. Further discussions have taken place between blood transfusion specialists and surgeons concerning the use and selection of blood components for these patients.

The data was obtained from the information system of the BTC of Slovenia. Clinical data and the exact amount of blood actually transfused were not collected. It is recognized that better clinical data collection is required. One of the first steps will be the introduction of a new standard blood request form. The legislation of blood transfusion currently in use is no longer sufficient. For this reason, a draft version of new legislation on blood transfusion was prepared in 1998. It includes obligatory data collection and reporting to the National Blood Transfusion Centre in order for a general report to be prepared for the Government.

In conclusion, although it is early days, it appears that the national programme focused on rational blood use is successfully improving clinical transfusion practice in Slovenia.

7.4 The National Blood Transfusion Service in Albania (Dr Tatjana Nurka)

The Blood Transfusion Service was created in 1951. From 1951–1992 glass bottles were used to collect blood and 100% of blood was collected from paid donors. The service provided bacteriology and immunohaematology services, processed placentae for gamma globulins and fractionated plasma for albumin. However, there was no policy of volunteer donation and no donor management systems. Transfusion microbiology was limited and there was no policy for the rational use of blood.

The political changes during the early 1990s led to a loss of transfusion service facilities. The service was faced with interruption of electricity and water supplies and heating systems. Since 1992, Albania has been rebuilding its national blood service, working with the WHO and the Council of Europe. The Ministry of Health established the first Blood Transfusion Advisory Committee in 1993. In January 1995, Parliament approved the first law specifically concerned with blood transfusion.

The principles of the Albanian blood service are:

• promotion of voluntary blood donation for the benefit of the nation;
• provision of adequate amounts of blood and blood products of high quality and accepted levels of safety to the clinical users;
• provision of modern immuno-haematology service;
• training in the area of blood transfusion technology and development of existing specialist in the field;
• training to the clinicians in blood transfusion medicine, in order to improve the use of blood and blood products.

The National Centre is primarily financed by the Government. The following foreign international agencies have played an important role in the development of the Service.
WHO emergency aid for improvement in blood supply project. This project is in cooperation with the Dutch Government. Support has provided equipment, staff training at the international centres abroad and renovation work (generator, water supply and incinerator).

British Government Overseas Development Administration; Know How Fund Assistance to ANBTS. This project was in cooperation with the Welsh Blood Transfusion Service providing education in technical, managerial and medical management. The project lasted one year and resulted in the business plan.

Structure. The National Blood Transfusion Centre is established in Tirana. There are an additional three local blood banks associated with the military, civil and maternity hospitals. The National Blood Transfusion Centre supports other transfusion centres including 23 district blood banks and three regional Centres.

All transfusion centres are responsible for:
- donor recruitment (relatives, autologous, voluntary)
- blood collection
- providing blood grouping and antibody screening service
- transfusion microbiology screening (rapid test)
- production of blood components (packed red cells and plasma)
- supply of test reagents and plasma products (imported or national) to the hospitals
- providing group compatible or cross-matching blood
- providing blood transfusion expertise to the clinicians
- 24-hour patient service
- delivery of blood and its products.

The regional centres also provide further microbiology testing (ELISA test). The national centre formulates national policy for ministerial approval, establishes procedures for quality services and delivers nationally agreed training.

Donors. The number of donors has decreased. Some of the reasons are thought to be:
- lack of a public campaign on blood donation;
- traditionally low level of donors in Albania (paid donors);
- donors excluded due to new techniques in blood testing (testing for HBsAg, HIV, HCV, CMV, TPHA);
- lack of cooperation between the blood service, especially local blood banks and clinicians to increase the number of donors.

Short-term goals for 1999
- To increase the number of volunteer donors. A committee has been created to drive a public recruitment campaign for volunteer donors. Partners in this campaign are the Red Cross, the SOROS Foundation, the government and nongovernmental organizations.
- To rationalize the clinical use of blood. Blood use has increased, in part due to the increase in the number of traffic and firearm accidents. The existing framework provides trained personnel at blood banks, blood ordering schedules and standard blood request forms. In
addition, there are national guidelines for blood ordering and use. However, the following are also required:

- intravenous replacement fluids (crystalloid and colloid) for the correction of hypovolaemia;
- transfusion committees to review blood use at central and local level;
- trained clinical staff;
- systems for monitoring and evaluation of clinical blood use.

**Goals for the future**

- increase voluntary donations;
- introduction of Transfusion Medicine as a separate subject at the Faculty of Medicine;
- postgraduate training for physicians in transfusion medicine;
- registration of reagents, plastic bags and other products at the National Drug Control Centre;
- strengthening of quality assurance and quality control systems
- standardization of our products;
- establishment of external control;
- promotion of policies for the rational use of blood and blood products;
- introduction of WHO Recommendations on Clinical Use of Blood.

**8. DAY 1: WORKING GROUP SESSIONS**

**8.1 Working group 1: Reduction of unnecessary use of blood and blood products in obstetrics**

**Moderator:** Dr S. Sturgiss  
**Participants:** Dr M. Dintinjana  Dr N. Manoku  
Dr V. Friptu  Dr D. Pfeifer  
Dr I. Jukic  Dr S. Pruna  
Dr D. Hudita  Dr J. Tofoski

**Issues for discussion**

- Methods for accurate data ascertainment with regards to the use of blood/blood products in pregnancy.
- Methods for the productive feedback of this information to hospitals.
- The involvement of representative national bodies.
- Guidelines for transfusion in an obstetric setting.
- Obstetric interventions for reducing transfusions.
Conclusions

- Problems identified at 1998 Annecy Meeting still remain.
- Encourage reporting over 500 ml and over 1000 ml haemorrhage.
- Encourage the governments and national bodies to collect necessary data, analyse and disseminate results to quantify the problem.
- Multidisciplinary team to decide on indicators of blood utilization.
- Organize feedback in a positive and constructive way.
- Set up transfusion committees to monitor data and disseminate results on regular basis.
- Secure adequate under- and post-graduate training on blood and blood products use, and appropriate management of cases to reduce the need of blood.
- Assess the maternal mortality or morbidity due to undertransfusion.
- Guidelines should be prepared and adopted on clinical blood management with reference to clinical conditions and local circumstances.
- Guidelines on haemorrhage management.
- Senior staff involvement in risk cases management.
- National obstetrics and gynaecology committees to look into management of III stage labour.
- After data collection phase set realistic targets to achieve in reduction of blood use.

8.2 Working group 2: Reduction of the unnecessary use of blood and blood products (general)

Moderator: Dr H. Doughty
Participants: Mr S. Azatyan Dr T. Nurka
Mr K-F. Bopp Dr M. Potocnik
Dr I. Dejanov Professor U. Rossi
Dr V. Hafner

1. WHO Guidelines
- Acceptable as general guidelines but may need to be adapted to meet local needs
- No specific triggers for transfusion are recommended
- Clinical evaluation of the patient should dictate the need for transfusion.

2. Effective communication is required for the following
- Promotion of clinical transfusion guidelines
- Education of the general population and patients
- Education and influence of media and ministers
- Education of the medical community.

3. Methods of communication and education within the medical community
- Newsletters
- Under- and post-graduate education
- Inclusion within re-accreditation programmes
- Joint clinical review between doctors responsible for transfusion and other clinicians
4. **Responsibility for transfusion practice**
- Senior clinicians should be responsible or aware of the costs of transfusion
- Clinicians should be responsible for, and justify the risks and benefits of transfusions
- Each unit of blood must be accounted for
- Clinicians must report adverse outcomes of transfusion.

8.3 **Working Group 3: Haemodilution and autologous transfusion in cardiac and other surgery with high transfusion requirements**

Moderator: Dr E. Ovrum  
Participant: Professor B. Solheim

1. **Biological principles of haemodilution**
- The body has an excess of red blood cells, platelets and coagulation factors, which allow safe, normo-volaemic haemodilution.

2. **Autologous transfusion**
- Pre-operative collection can be of great value in a situation where there is lack of other sources of safe blood. However, this is dependent on the patient’s clinical condition, and local organization (collection, handling and distribution).
- Peri-operative haemodilution, including autologous removal, is safe and effective for blood conservation in cardiac surgery.
- Intra-operative blood salvage is recommended (cardiotomy suction; cell savers; CPD collection).
- Post-operative re-transfusion of blood can be performed with or without cellular processing. The shed blood is highly activated regarding coagulation, fibrinolysis, the immune mediators (complement, cytokines). Despite this activation, clinical experience has not demonstrated any deleterious effects.
- The extensive experience of haemodilution and autologous transfusion in cardiac surgery is also applicable to other types of surgery with high transfusion requirements.

8.4 **Working Group 4: The role of the pharmacist in relation to plasma substitutes**

Moderator: Dr P. Janssen  
Participants: Dr A.O. Agger  
Dr A. Dawson  
Dr T. Kezeli
1. **Hospital-based**

   **Current role across Europe**
   - Advice on use of albumin, coagulation factors and immunoglobulin.
   - Ensure good quality products (drugs; fluid).

   **Future role**
   - Expand advice to blood components.
   - Initiate closer links with Blood Transfusion Committee (decision-making process).
   - Ensure use of good quality products; ensure cold chain maintained where necessary.
   - Act as resource for education of patient and provider.
   - Member of relevant Hospital Committees (guidelines).
   - Lobby government to ensure the quality of products – commercially produced.
   - Ensure traceability/registration of products.
   - Clinical resource.

2. **Community-based**

   **Current role**
   - Dispense prescribed and non-prescribed drugs.
   - Educatively, advisory, counselling role.
   - Ensure quality of product in cold chain.

   **Future role**
   - As above – ensure implementation.
   - Link to hospital and community.
   - Member of Blood Transfusion Committee.

3. **Extend the role of the pharmacist**

   - by helping to improve clinical outcomes;
   - by supporting clinician in decision-making process and where necessary where clinician is not available, providing clinical care;
   - by providing a source of informed clinical expertise in life-threatening situations.

9. **DAY 2: WORKING GROUP SESSIONS**

9.1 **Working Group 1: National strategies for better use of blood and blood products**

   **Moderator:** Dr I. Dejanov
   **Participants:**
   - Dr S. Azatyan       Dr T. Kezeli
   - Dr H. Doughty       Dr T. Nurka
   - Ms D. Fowler        Dr M. Potocnik
   - Dr V. Hafner        Dr U. Rossi
   - Dr I. Jukic         Dr S. Sturgiss
**Is there a real need for national strategies for better use of blood and blood products in a globalized world?**

**National strategies are required**

- A national transfusion committee or equivalent national body should formulate strategy and provide guidance and monitoring for practice.
- National guidelines based on international standards should be available.
- National committees should communicate and disseminate information via local transfusion committees.
- Pharmacotherapeutic committees may form a useful support or start for transfusion committees.

**National strategies for better use of blood and blood products are needed**

- **Availability** – Blood collection and use should be coordinated. Coordination may be on a local, regional or national scale.
- **Cost** – A national price structure is recommended to improve coordination and cooperation within a country. Countries should consider the most cost-efficient approach for fractionation of plasma. Approaches include sending plasma to another country for fractionation rather than investing in their own fractionation plant.
- **Use and abuse of blood and blood products** – A national approach to education of users is important. The recommendation from other workshops is endorsed. Clinicians should undertake responsibility for transfusions given. The use of transfusion therapy should be reviewed. The data after comparison with other users, centre and countries could then be used to inform practice.
- **Adverse effects of blood and blood product use** – National haemovigilance systems should be considered. Reporting should be simple, user friendly, confidential and without penalty. Successful systems include report sheets incorporated with the issue paperwork. Voluntary and compulsory systems may be considered. Some adverse effects of transfusion such as infection can be reduced by greater use of autologous transfusion including salvage.
- **Optimal selection and assessment of transfusion therapy** – Clinical guidelines should be developed to support transfusion therapy. Specific component therapy should be considered where available. Transfusion therapy should have clear objectives. Objectives may include clinical and laboratory measures. The objectives should be monitored before and after transfusion.

**Measures to implement national strategies in everyday practice**

- National transfusion committees or equivalent should direct and support good transfusion practice.
- National and local transfusion committees should have executive power where possible.
- An audit or reflective approach to practice is recommended.
- All users should be involved in transfusion audit.
- Examples of good practice should be recognized.
9.2 Working group 2: The use of information technology to support national strategies for the rational use of blood and blood products

Moderator: Professor B. Solheim
Participants: Dr A. Dawson Mr S. Pruna
Dr A. Kelleher Dr E. Ovrum
Dr D. Pfeifer

1. Electronic blood bank systems
   - Support non-serological or the electronic “cross-match”
   - Optimal reporting requirements features should be adapted to the clinicians’ needs
   - Support the use of basic information sheets
   - Blood banks should maintain information on all products issued to individual patients.

2. Audit systems for collection of clinical blood transfusion data
   - Keep simple, ask for amount of minimal information
   - Request reason for transfusion
   - Identify responsible clinician
   - Record outcomes
   - Record adverse side effects (including minor)
   - Merge data available from other sources in the institution.

3. Feedback from the blood bank systems to the clinicians
   - Pattern of blood products demand and issue, by case and clinician
   - Total blood products consumed
   - Complication rate.

4. The need for data
   - Organize regular audits and analyse the data
   - Review the data together with other information provided by clinicians, i.e. ICD-10 codes, interventions done, laboratory data (Hb, Hct, O₂)
   - Improve the communication between the blood bank and the clinicians
   - It’s the clinical situation you transfuse, NOT the haemoglobin, haematocrit or platelet count
   - National data relies on accurate aggregated blood utilization data of blood banks.

9.3 Working Group 3: Reduction of transfusion-transmitted infections (TTIs)

Moderator: Dr A. Padilla
Participants: Dr A. Gromyko
Mr P. Janssen

National quality management policies for blood transfusion services should address the following:
1. **Blood transfusion activities**
   - Criteria for selection of safe blood donors: donor selection; donor registration; donor deferral; appropriate questionnaires; educational and training programmes.
   - Good manufacturing practices should be formulated and implemented for the adequate collection, processing, storage, transport and testing of blood.
   - Control authorities for medical products should develop a national system to identify suitable and unsuitable diagnostic kits for blood testing. Need for reference preparations.
   - Countries should test all blood donations according to the WHO requirements as formulated in TRS 840; 1994 and complementary WHO documents on blood testing.
   - National health authorities should take the responsibility to ensure the implementation of blood manufacturing practices and the use of safe blood and blood products.
   - National policies and medical training should be developed to reduce the use of blood for transfusion.
   - Updated information on epidemiological situation in the countries with regard to TTIs should be available to the blood transfusion services.

2. **Plasma fractionation activity**
   - Strict requirements for the quality and safety of plasma for fractionation, as source material for fractionation activities should be applied by the national control authorities.
   - Viral inactivation/removal procedures and their validation studies should be incorporated in all the manufacturing processes for the production derivatives.

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Quality assurance of plasma derived medicinal products and plasma fractionation activities

| Prevent transmission of blood borne viral diseases via plasma products |
|---------------------------|----------------------|----------------------|
| Plasma fractionation Activities: alternatives | Viral inactivation removal – procedures | Control tests to assure viral safety in plasma products |
| Upgrading NHLs/NCAs expertise in manufacture, quality and safety procedures |

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**9.4 Working Group 4: Optimal iron stores in relation to pregnancy**

*Moderator:* Dr A.O. Agger  
*Participants:*  
- Dr M. Dintinjana  
- Dr N. Manoku  
- Dr D. Hudita  
- Professor J. Tofoski
• There is a need to review the WHO definition of anaemia of pregnancy.
• Check for anaemia at two months gestation.
• Any anaemia before twentieth week of pregnancy should be evaluated by a haematologist.
• Starting level for iron supplementation is less than 10g/dl. Hb.
• The starting point of iron supplementation is the twentieth week of gestation.
• The dosage for supplementation if 66 mg/day Fe++. 
• Never give blood transfusion during pregnancy to improve anaemia, except following severe haemorrhage.
• The obstetricians/health attendants should tolerate anaemia as long as the pregnant women does.
• These suggestions are broad guidelines for national health guidelines.

10. SUMMARY OF WORKSHOP RECOMMENDATIONS

1. National strategies

1.1 A national transfusion committee or equivalent body should formulate policies based on international standards and communicate them to users of blood and blood products.

1.2 A national pricing structure is recommended to improve national cooperation and coordination.

1.3 The use of transfusion therapy should be regularly audited and reviewed according to clear clinical and laboratory objectives and expected outcomes.

1.4 A national system for follow up of adverse effects of blood and blood products is recommended and should be encouraged by simplification of the reporting procedures.

2. The use of information technology

2.1 Clinical blood transfusion data and information on all products issued to patients should be maintained preferably on computer systems.

2.2 Sample audit on patterns of use of blood products should be made available to clinical users.

2.3 National data should be accumulated based on patterns of local information on utilization in blood banks.

3. Reduction of transfusion transmitted infection

3.1 Blood transfusion activities should be regulated by clear national policies and quality measures of all aspects of transfusion practice including donor selection, donation testing, processing, supply and usage of blood.
3.2 Fractionation and preparation of plasma derivatives should be subject to strict GMP standards and quality management measures starting by the plasma donations up to the finished products.

4. **Anaemia and pregnancy**

4.1 All pregnant women should be monitored for anaemia at 8 and 20 weeks gestation. The type of anaemia should be ascertained and appropriate haematinics should be given. Iron supplementation should be adequate and sustained throughout pregnancy.

4.2 Transfusion should be contra-indicated for uncomplicated anaemia during pregnancy.

5. **Transfusion in obstetrics**

5.1 Data collection is necessary in obstetrics. Reporting of bleed episodes of 1000 ml or over is to be encouraged by hospital transfusion committees.

5.2 Guidelines should be developed for management of stage III labour including criteria for transfusion and its place in the management of haemorrhage.

5.3 Feedback of analysis of data should be used for training of users of blood and blood products.

6. **Reduction of unnecessary transfusion in general**

6.1 Promote clinical transfusion guidelines through undergraduate and postgraduate education, accreditation programmes, audit activities, HTC newsletters and regular joint clinical review meetings.

6.2 Involve senior clinicians to take direct responsibility for transfusion practice within their respective units.

7. **Autologous transfusion**

7.1 Promote and facilitate introduction of all autologous transfusion modalities.

7.2 Provide training and exchange of expertise between users in all surgical specialities.

8. **Role of the pharmacist**

8.1 Enhance the role of transfusion trained pharmacists to ensure availability of good quality products for hemotherapy including crystalloids and colloids.

8.2 Expand role in provision of advice on pharmacological effects, dosage and dispensing of blood and blood products.

8.3 Extend role to support clinical decision-making processes to improve outcomes of transfusion therapy in general.
11. CLOSURE

The Workshop was summarized by Dr Heidi Doughty who thanked Dr Kirsten Staehr Johansen and her team on behalf of all the participants. The Workshop had continued to build on the recommendations made in previous workshops. Presentations received from eastern European representatives have demonstrated the progress being made often in very difficult conditions. Experience reported from Oslo has demonstrated that surgery traditionally associated with high transfusion requirements can be managed without transfusion by adopting alternative approaches to management.

The issues identified during this meeting were:

• the role of a national level committee in establishing appropriate clinical guidelines and monitoring clinical transfusion practice;
• practice should be modified in the light of data collected concerning use, outcomes and complications;
• change in practice should be underpinned by education of the general and medical communities;
• specific guidelines for the use of transfusion in obstetrics were called for, building on the knowledge gained from the OBSQID project;
• WHO should consider working with other agencies to establish a common core of transfusion knowledge.

The workshops have focused again on the need for national strategies for the management of blood which must be considered a national asset. The specific recommendations from the workshops are summarized at the end of this document.

Participants undertook to try to apply the principles espoused by this and previous WHO workshops. The outcomes of national experiences should be reported and shared in a further workshop. The Workshop was formally closed by Dr Kirsten Staehr Johansen on 30 January.

The Mérieux Institute has kindly offered to host the next workshop in November 2000.
I have gone through your report of the Third Workshop on the Use and Abuse of Blood and Blood Products in Clinical Settings, which took place in Annecy in January 1999.

The report seems to follow the usual structure of WHO Workshop reports. I assume that the obstetric use of blood was included just as an example without trying to emphasize neither its importance over other areas, nor trying to imply that it is the only clinical situation where blood is needed. I suppose it is the most important one at present in the countries that presented their local situations in the workshop. This could perhaps be explained in the recommendations, because it seems otherwise a bit strange that obstetrics and pregnancy are the only clinical conditions mentioned in the recommendations.

The same is true with the last paragraph of recommendations, which concerns the role of the pharmacist. In most parts of the world, the pharmacist has practically no role in a blood transfusion service. If pharmacists are employed in blood transfusion, like the case may be in former Yugoslavia and in some central Asian countries, this should be specifically mentioned. Otherwise, it is a bit difficult to understand why the role of one type of experts is emphasized in a WHO recommendation and why, e.g. nurses, biologists, chemists or medical doctors are not included in the recommendation. In many countries, these do the same jobs in transfusion medicine as pharmacists in others.

The WHO headquarters Blood Safety Department is involved in the process of developing distance learning material for appropriate use of blood. It might be a good idea to refer to this in the recommendations, and to ensure that this is taken up at the next meeting.

Dr Jukka Koistinen, Finland

Pricing – yes – but the prelude to a pricing structure, implying as it does, that governments have settled upon a strategy of “cross-charging” within their health services, is a detailed costing exercise, which so many countries in the former Soviet bloc have not carried out as yet. “Cross-charging” or zero-budgeting is a suitable way to escape the impossible situation many BTSs find themselves in, where a sharply increased demand for greater product diversity and quality can hardly be met by a fixed budget.

Naturally, the drawback of this approach is that the financial burden then falls upon the hospital users who are equally deprived of funds. Nevertheless, objective costing is the prerequisite to a pricing policy, and the two may not necessarily be the same.

Antenatal care must be enhanced, as much more could be done to avoid anaemia and the need for transfusion in the third trimester, or at delivery.
Certainly, there is evidence of profligacy in the use of red cells and FFP in the countries of the former Soviet Union. However, there is also considerable misuse and under-use of blood components as well, which does deserve mention. Under-use is most often due to poor absolute availability of components, as well as unavailability in a timely manner. It is also due to poor risk/benefit appraisal, together with the often exaggerated recent exhortations to the effect that the best transfusion practice is no transfusion. Lundsgaard-Hansen has rightly warned of the silent myocardial ischaemia which accompanies under-transfusion in vulnerable patients.

Misuse is mainly due to ignorance of correct transfusion practice, or simply the influence of long-hallowed malpractice: the use of large volumes of FFP during and after cardiac bypass surgery to prevent or mitigate MVB, when platelet concentrates might be more effective. This is particularly true in cases where antiquated bubble-oxygenators are still being employed; the use of peri-operative FFP as a plasma expander even when synthetic colloids and albumin are available ...

I do hope these few comments are of some value, and I also hope invaluable meetings of this kind will continue to be funded at regular intervals. Lack of communication and isolation are probably the most significant problem afflicting these countries in the recent past.

Dr F.A. Ala, Birmingham, United Kingdom

Quite a tough assignment to produce a neat report from this meeting. Not too obvious who the target group is/are. The quality of the material is varied but Steve Sturgiss’ piece is good. I wonder if you could compile a few of his messages into an “executive summary” or similar, as that is all most people read, so you could get some useful messages across.

Brian McClelland, Edinburgh, United Kingdom
Annex 2

SCOPE AND PURPOSE

The Third Workshop on use and abuse of blood and blood products is related to target 31 of the Health for All Policy on quality of care, and to the concept of continuous quality of care development (QCD), which focuses on outcomes of care, cost effectiveness and optimal use of resources. The effective rational use of blood is an integral component of health care reforms as the inappropriate use of blood and blood products represents a major risk for the population, in addition to augmenting the cost of health care services.

The First Workshop was held in June 1996 in Tirana, Albania, as part of the project for emergency aid for improvement of blood supply in Albania, which brought together blood banks, obstetricians, paediatricians and general surgeons from Albania and the Former Yugoslav Republic of Macedonia, as well as representatives from the Albanian Red Cross. Although the basic objective of the project was to ensure availability of safe blood for Albania, it was clear that a link to the use of blood by surgeons and other health care providers was a crucial part.

The Second Workshop, held in February 1998 in Annecy, France, expanded the scope and participation in the programme, involving surgeons and obstetricians from other EURO Member States, as well as specialists from WHO Geneva, the European Commission and the European Parliament. The subjects covered included an in-depth look at the adequate use of blood and blood products in obstetrics and perinatology, as well clinical assessment and quality management.

The Third Workshop will focus on development and implementation of the recommendations from the Second Workshop concentrating on results of data collection for monitoring, evaluation and feedback in the areas of cardiac surgery and obstetrics, and on blood products, with reports from country activities. An overview will be made of the achievements in specific projects involving Albania and Romania.
Annex 3

PROVISIONAL PROGRAMME

Thursday, 28 January

18.00–19.00  Registration
19.00–19.30  Welcome

*Dr Gilles Landrivon, Director, Mérieux Institute and WHO/EURO*

Setting the Scene: Recommendations from the Second Workshop on Blood Safety, Annecy, 1998

*Professor Susan Hollan*

19.30–20.00  Election of Chairperson and Rapporteur
Adoption of programme
Briefing on background, purpose and expected outcome

21.00  Dinner

Friday, 29 January

09.00–09.15  General introduction
09.15–09.30  Blood transfusion in obstetric practice

*Dr Steven Sturgiss*

09.30–09.45  Blood transfusion and non blood management in obstetrics

*Dr Dina Pfeifer*

09.45–10.30  Blood transfusion in obstetric practice

*Dr Anders Ole Agger*

Country experiences: Romania
Use of blood and blood products in clinical settings and relation to existing blood committees

*Dr Valentina Hafner*

Iron status and transfusion in the former Yugoslav Republic of Macedonia

*Professor Jovan Tofovski*

10.30–11.00  Coffee Break
11.00–11.30  Blood transfusion in cardiac surgery

*Professor Bjarne Solheim*

Use of blood and blood products in cardiac surgery

*Dr Eivind Ovrum*

11.30–11.45  Country experiences: Albania

*Dr Tatjana Nurka*
11.45–12.00 Serious hazards of transfusions: UK experience in haemovigilance  
*Dr Heidi Doughty*

12.00–12.15 Reduction of transfusion-transmitted infections (TTI)  
*Dr Alexander Gromyko*

12.15–12.30 Use of plasma substitutes  
*Mr Paul Jansson*

12.30–12.45 The contribution of the ESTM to the rational, effective use of blood and blood products and to the “quality” of clinical indications for transfusion therapy  
*Professor Umberto Rossi*

12.45–13.00 Summary of the morning lectures and introduction of workshops  
*Dr Heidi Doughty*

13.00–14.00 Lunch

14.00–16.00 Parallel working groups:

1. Reduction of unnecessary use of blood and blood products in obstetrics  
   *Moderator: Dr Steven Sturgiss*

2. Reduction of unnecessary use of blood and blood products in general  
   *Moderator: Dr Heidi Doughty*

3. Haemodilution and autologous transfusion in cardiac and other surgery with high transfusion requirements  
   *Moderator: Professor Bjarte Solheim*

4. The Role of the pharmacist in relation to plasma substitutes  
   *Moderator: Dr Paul Janssen*

16.00–16.30 Coffee Break

16.30–18.00 Reports and recommendations from working groups

19.30 Conference dinner

**Saturday, 30 January**

09.00–09.20 How to launch an internet service for collection and transfer of data within different health centres  
*Mr Simion Pruna*

09.20–09.45 Experience gained through the OBStetrical Quality Indicators and Data (OBSQID) collection  
*Visti Juncher*

Epi Info: a tool for evidence-based medicine with special reference for use of blood  
*Dr Dina Pfeifer*

09.45–10.00 Rationalization of blood transfusion in Slovenia in 1998  
*Dr Marjeta Potocnik*

10.00–10.15 Rationalization of blood transfusion in the former Yugoslav Republic of Macedonia  
*Professor Dr Ivan Dejanov*
10.15–10.30  How data collection can play a role: Establishing twinning projects between centres demonstrating good outcomes with a rational use of blood and blood products, with centres in need
   Dr Kirsten Staehr Johansen
10.30–11.00  Coffee break
11.00–13.00  Parallel working groups
   1. National strategies for better use of blood and blood products
      Moderator: Dr Mike McGovern
   2. The use of information technology to support national strategies for the rational use of blood and blood products
      Moderator: Dr John Burman
   3. Reduction of transfusion-transmitted infections (TTI)
      Moderator: Dr Ana Padilla
   4. Optimal iron stores in relation to pregnancy
      Dr Anders Ole Agger
13.00–14.00  Lunch
14.00–15.30  Reports
15.30–16.00  Summary and closure
Annex 4

PARTICIPANTS

Dr Anders Ole Agger
Department of Obstetrics and Gynaecology
Herning Hospital
Gl. Landevej 61
DK-7400 Herning
Denmark
Tel. No.: +45 49 27 27 27

Mr Samvel Azatyan
Head
Department of Pharmacovigilance and Rational Drug Use
Armenian Drug and Medical Technology Agency (ADMTA)
Moskovyan 15
375001 Yerevan
Armenia
Tel. No.: +374 2 58 41 20
Fax No.: +374 2 151697

Mr Karl-Friedrich Bopp
Administrative Officer
Health and Social Policy Division
Direct. of Social and Economic Affairs
Council of Europe
Strasbourg
France
Tel. No.: +33 388 41 2214
Fax No.: +33 388 41 2726

Dr Ivan Dejanov
c/o Professor Jovan Tofoski
Gynecolsko akuserska klinika
Medical Faculty
Vodnjanska 17
91000 Skopje
Former Yugolav Republic of Macedonia
Tel. No.: +389 91 11 97 27
Fax No.: +389 91 116 182

Dr Miran Dintinjana
Department of Obstetrics and Gynaecology
Slajmerjeva 3
SI-1000 Ljubljana
Slovenia
Fax No.: +386 6131 5328

Dr Heidi Doughty (Rapporteur)
National Blood Service
Vincent Drive, Edgbaston
Birmingham B15 2SG
United Kingdom
Tel. No.: +44 121 253 4000
Fax No.: +44 121 253 4003

Professor Wojciech Dyszkiewicz
Head
Clinic of Thoracic Surgery
ul. Szamarzewskiego 60-569 Poznan
Poland
Tel. No.: +48 61 866 9053
Fax No.: +48 61 866 9053

Dr Valentin Friptu
Mother and Child Research Institute
Hincheshti Str. 1
MD-2009 Chisinau
Romania
Tel. No.: + 373 272 1010
Fax No.: + 373 273 8781

Dr Valentina Hafner
Blood Transfusion Center
National Institute of Haematology and Transfusion
str. Constantin Caracas nr. 2-8
78156 Bucharest
Romania
Tel. No.: +40 1 650 7410
Fax No.: +40 1 659 6900

Professor Decebal Hudita
Vice President
Romanian Society of Obstetrics and Gynaecology
Hospital Ion Cantacuzino
Str Ion Movila no. 5-7, sect. 2
Bucharest
Romania
Dr Paul Janssen  
Pharmacy  
Academic Hospital Rotterdam  
P.O. Box 2040  
3000 CA Rotterdam  
Netherlands  
Tel. No.: +31 10 46 331 42  
Fax No.: +31 10 43 666 05

Dr Irene Jukic  
Croatian Institute of Transfusion Medicine  
Petrova 3  
10 000 Zagreb  
Croatia  
Tel. No.: +385 46 33 283

Dr Andrea Kelleher  
Department of Anaesthaesia & Intensive Care  
Royal Brompton Hospital  
Sydney Street  
UK-London- SW36NP  
United Kingdom  
Tel. No.: +44 171 351 85 23  
Fax No.: +44 171 351 85 24

Ms Tamara Kezeli  
Head  
Department of Clinical Examinations  
Ministry of Health  
K.Gamsakhurdia ave., 30  
380060 Tbilisi  
Georgia  
Tel. No.: +995 32 39 0514  
Fax No.: +995 32 93 4437

Dr Gilles Landrivon  
Director  
Fondation Mérieux  
Les Pensières  
55 Route D'Annecy, Chavoirs  
F-74290 Veyrier-du-Lac  
France  
Tel. No.: +33 450648080  
Fax No.: +33 450601971

Dr Nikita Manoku  
Chief, Obstetrics and Gynaecology  
Maternity Hospital No. 1  
Tirana  
Albmania

Dr Charles Merieux  
Président  
Fondation Mérieux  
17, rue Bourgelat  
F-69227 Lyon Cedex 02  
France  
Tel. No.: +33 04 7273 7920  
Fax No.: +33 04 7273 7993

Ms Macha Musset  
Fondation Mérieux  
Les Pensières  
55 Route D'Annecy, Chavoirs  
F-74290 Veyrier-du-Lac  
France  
Tel. No.: +33 450648080  
Fax No.: +33 450601971

Dr Mircea Musset  
President, Association Bioassistance  
53, route du Port  
F-74290 Menthon St Bernard  
France  
Tel. No.: +33 4 5064 8080  
Fax No.: +33 4 5060 1971

Dr Tatiana Nurka  
Director, National Blood Transfusion Service  
c/o WHO Liaison Office  
Ministry of Health  
Tirana  
Albania  
Tel. No.: +355 4264270  
Fax No.: +355 4264270

Dr Marjeta Potocnik  
Managing Director  
Zavod Republike Slovenije za transfuzijokrvi  
Slajmerjeva 6  
SI-1000 Ljubljana  
Slovenia

Mr Simion Pruna  
President  
Romanian Society for Clinical Engineering &  
Medical Computing  
Hospital Cantacuzino, I.  
Movila Street, 5-7,2  
RO-79811 Bucharest  
Romania  
Tel. No.: +40 1 63 41 735  
Fax No.: +40 1 33 23 625
Professor Umberto Rossi  
Executive Committee President  
European School of Transfusion Medicine  
V.le Beatrice d'Este 5  
I-20122 Milan  
Italy  
Tel. No.: +39 02 583 165 15  
Fax No.: +39 02 583 163 53

Professor Bjarte Solheim (*Chairperson*)  
ITI National Hospital  
N-0027 Oslo  
Norway  
Tel. No.: +47 22 86 74 79  
Fax No.: +47 22 20 36 93

Dr Steven Sturgiss  
Consultant Obstetrician  
Royal Victoria Infirmary  
Queen Victoria Road  
GB-NE1 4LP Newcastle upon Tyne  
United Kingdom  
Tel. No.: +44 191 2325 131  
Fax No.: +44 191 2275 194

Professor Jovan Tofoski  
Gynekolosko akuserska klinika  
Medical Faculty  
Vodnjanska 17  
91000 Skopje  
Former Yugoslav Republic of Macedonia  
Tel. No.: +389 91 11 97 27  
Fax No.: +389 91 116 182

Dr Ejvind Ovrum  
Head, Cardiology Center  
ITI National Hospital  
N-0027 Oslo  
Norway  
Fax No.: +47 22 869275

World Health Organization  
*Regional Office for Europe*  
Ms Lisa Copple  
Dr Ann Dawson  
Ms Dawn Fowler  
Dr Alexander Gromyko  
Mr Visti Juncher  
Dr Dina Pfeifer  
Dr Kirsten Staehr Johansen